

**WHAT IS CLAIMED IS:**

1. A display system, comprising:
  - a) a light modulator having at least three linear arrays of light modulating devices on a common substrate;
  - b) at least one light source producing at least three colors of light for illuminating the at least three linear arrays;
  - c) a lens for creating line images of the at least three linear arrays on a display surface; and
  - d) a scanning mirror for scanning the line images to create a two-dimensional image on the display surface.
2. The display system claimed in claim 1, wherein the at least three linear arrays of light modulating devices are independently addressable.
3. The display system claimed in claim 1, wherein the light modulating devices are electro-mechanical grating devices.
4. The display system claimed in claim 3, wherein the light modulating devices are GEMS devices.
5. The display system of claim 1 wherein the arrays of light modulating devices are flexible micromirror linear arrays.
6. The display system claimed in claim 1, wherein at least two of the at least three linear arrays differ in device resolution.
7. The display system claimed in claim 1, wherein the at least three colors include red, green, and blue.

8. The display system claimed in claim 7, wherein the linear array illuminated by the blue color provides a lower device resolution than the linear array illuminated by the green color.

9. The display system claimed in claim 1, wherein an electrical connection to one of the at least three linear arrays is interwoven with the light modulating devices of a different linear array.

10. The display system claimed in claim 1, wherein an electrical connection to one of the at least three linear arrays is made around a different linear array.

11. The display system claimed in claim 1, further comprising:  
e) a plurality of parallel reflective segments for directing illumination of the at least three colors of light onto the at least three linear arrays.

12. The display system claimed in claim 1, further comprising:  
e) a polarization beam splitter for directing illumination of the at least three colors of light onto the at least three linear arrays; and  
f) a quarter-wave plate for modifying polarization of the at least three colors of light.

13. The display system claimed in claim 1, further comprising:  
e) a cover prism residing atop the at least three linear arrays.

14. The display system claimed in claim 13, wherein the least three colors of light illuminate the at least three linear arrays at an oblique angle with respect to an orthogonal direction of the light modulator.

15. A display system having a trilinear array of electro-mechanical grating devices, comprising:

- a) a light modulator having three independently addressable linear arrays of electro-mechanical grating devices on a common substrate;
- b) at least one light source producing three colors of light for illuminating the three independently addressable linear arrays, wherein the three colors of light are red, green, and blue;
- c) a lens for creating line images of the three independently addressable linear arrays on a screen, wherein the line images comprise diffracted orders of light;
- d) an obstructing element for selecting the diffracted orders of light; and
- e) a scanning mirror for sweeping the line images to create a two-dimensional image.

16. The display system claimed in claim 15, wherein the light modulating devices are GEMS devices.

17. The display system claimed in claim 15, wherein at least two of the three independently addressable linear arrays differ in device resolution.

18. The display system claimed in claim 15, wherein the independently addressable linear array illuminated by the blue color provides a lower device resolution than the independently addressable linear array illuminated by the green color.

19. The display system claimed in claim 15, wherein an electrical connection to one of the three independently addressable linear arrays is interwoven with the electro-mechanical grating devices of a different independently addressable linear array.

20. The display system claimed in claim 15, wherein an electrical connection to one of the three independently addressable linear arrays is routed around a different independently addressable linear array.

21. The display system claimed in claim 15, wherein the obstructing element includes a plurality of parallel reflective segments that also direct illumination of the three colors of light onto the three independently addressable linear arrays.

22. The display system claimed in claim 15, further comprising:

f) a polarization beam splitter for directing illumination of the at least three colors of light onto the three independently addressable linear arrays; and

g) a quarter-wave plate for modifying polarization of the three colors of light.

23. The display system claimed in claim 15, further comprising:

f) a cover prism residing atop the three independently addressable linear arrays.

24. The display system claimed in claim 23, wherein the three colors of light illuminate the three independently addressable linear arrays at an oblique angle with respect to an orthogonal direction of the light modulator.

25. A method for displaying a two-dimensional image on a display surface, comprising the steps of:

a) simultaneously providing three colors of light to a light modulator having three independently addressable linear arrays of light modulating devices on a common substrate;

- b) creating line images of the three independently addressable linear arrays on the display surface;
- c) providing an image data stream to each of the three independently addressable linear arrays, wherein the image data stream is synchronized according to a spatial separation between the line images of the three independently addressable linear arrays;
- d) scanning the line images across the screen in coordination with the data stream to create the two-dimensional image.

26. The method claimed in claim 25, wherein the step of creating line images comprises the step of forming diffracted orders of light.

27. A method for displaying a two-dimensional image on a display surface, comprising the steps of:

- (a) directing, to each of three independently addressable linear arrays of light modulating devices on a common substrate, a color illumination beam;
- (b) modulating each of the three independently addressable linear arrays of light modulating devices according to an image data stream, forming three spatially separate line images thereby;
- (c) scanning the three line images toward the display surface to form the two-dimensional image thereon.

28. 26. A method for displaying a two-dimensional image on a display surface according to claim 27 wherein the step of modulating comprises the step of synchronizing the image data stream according to the distance between the spatially separate line images.